**Claims:**

1. An aqueous cross-linked polymer solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship.

2. The solution as defined in claim 1, wherein said polymer may be cross-linked via any one of covalent, ionic and hydrogen bonds, thereby creating a structured network which entraps water molecules.

3. The solution as defined in claim 1, wherein said polymer is cross-linked by any one of bi- and polyvalent cations, and wherein said cations are calcium, copper, aluminum, magnesium, strontium, barium, tin, zinc, chromium or organic cations, poly(amino acids), poly(ethyleneimine), poly(vinylamine), poly(allylamine), and polysaccharides.

4. The solution as defined in claim 1, wherein said cross-linked polymer is a hydrogel-forming polymer.

5. The solution as defined in claim 1, wherein said cross-linked polymer is a polysaccharide.

6. The solution as defined in claim 1, wherein said cross-linked polymer is an alginate, and wherein said alginate has a molecular weight ranging from 10K to 300K Dalton, preferably between 25K and 150K Dalton.

7. A cross-linked polymer solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship, wherein said solution is prepared by cross-linking a polymer precursor solution that exhibits

Newtonian behavior and has a viscous response which is greater than its elastic response when small deformation oscillatory frequencies are applied.

8. A cross-linked alginate solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship, wherein said solution is prepared by cross-linking an alginate precursor solution that exhibits Newtonian behavior and has a viscous response which is greater than its elastic response when small deformation oscillatory frequencies are applied.

9. The cross-linked alginate solution as defined in claim 8, wherein said applied small deformation oscillatory frequencies are within the viscoelastic limit, i.e. within the range from about 0.01-100 Hz, preferably between 0.1-10 Hz.

10. The cross-linked alginate solution as defined in claim 8, comprising 0.1-4% (w/v) cross-linked alginate.

11. The cross-linked alginate solution as defined in any one of claims 8 to 10, wherein said solution is storage stable in that it maintains its solution form and syringeability for long periods of time, and wherein said solution forms a gel *in vivo* when administered to a subject.

12. A method of preparing a cross-linked alginate solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship, wherein said method comprises the steps of:

(a) dissolving sodium alginate in water or in other suitable aqueous buffer;

(b) cross-linking the alginate solution obtained in step (a) with a suitable cross-linking agent, by adding a suitable volume of an aqueous solution of

said agent while stirring intensively until an uniform solution is obtained, wherein said suitable cross-linking agent is selected from the group consisting of salts of calcium, copper, aluminum, magnesium, strontium, barium, tin, zinc, chromium and organic cations, poly(amino acids), poly(ethyleneimine), poly(vinylamine), poly(allylamine), and polysaccharides.

13. The method as defined in claim 12, wherein said salt of calcium is calcium gluconate.

14. A method of preparing a cross-linked alginate solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship, wherein said method comprises the steps of:
(a) dissolving sodium alginate in water or in other suitable aqueous buffer;
(b) cross-linking the alginate solution obtained in step (a) with calcium ions, by adding a suitable volume of a 2% (w/v) calcium gluconate solution while stirring intensively, until a uniform solution is obtained.

15. A cross-linked alginate solution prepared by the method of claim 14.

16. A cross-linked polymer solution as defined in any one of claims 1 to 10 and 15, for promoting repair and regeneration of damaged cardiac tissue.

17. A composition comprising as active agent a cross-linked polymer solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship.

18. A composition comprising as active agent the cross-linked alginate solution of claim 15, or a cross-linked alginate solution having an elastic response which becomes equal to or greater than its viscous response when small deformation oscillatory frequencies are applied and which reveals shear thinning behavior in a power-law relationship, wherein said solution is prepared by cross-linking an alginate precursor solution that exhibits Newtonian behavior and has a viscous response which is greater than its elastic response when small deformation oscillatory frequencies are applied, wherein said cross-linked solution is storage stable in that it maintains its solution form and syringeability for long periods of time, and forms a gel *in vivo* when administered to a subject.

19. The composition as defined in claim 17, for promoting repair and regeneration of damaged tissue.

20. The composition as defined in claim 18, for promoting repair and regeneration of damaged tissue, wherein said tissue is cardiac tissue, preferably the left ventricular wall, and said damage is selected from the group consisting of myocardial infarction, ischemic, toxic, inflammatory and mechanical myocardial damage.

21. The composition as defined in claim 20, for use in the prevention and/or treatment of conditions resulting from myocardial damage, remodeling and dysfunction, wherein said conditions are selected from the group consisting of left ventricular remodeling, infarct expansion, heart failure, ischemic mitral regurgitation.

22. The composition as defined in claim 20, for use in the treatment of reentry arrhythmia.

23. The composition as defined in claim 20, for use in therapeutic angiogenesis.

24. The composition as defined in claim 20, for use in stem cell chemotaxis and/or homing.

25. The composition as defined in claim 20, wherein said composition further optionally contains additional therapeutic agents, wherein said additional therapeutic agents are selected from the group consisting of antibiotics, growth factors, anti-inflammatory drugs, hormones, anti-apoptotic drugs, growth and stem cell stimulating factors.

26. The composition as defined in claim 20, further comprising cells, wherein said cells are any one of myoblasts, cardiomyocytes, fibroblasts, endothelial cells, progenitor cells, stem cells or any other suitable cells that promote cardiac angiogenesis and regeneration.

27. A method of treatment of damaged tissue, comprising administering a cross-linked polymer solution as defined in any one of claims 1 to 7 or a composition of any one of claims 17-26, to a subject in need.

28. A method of treatment of damaged tissue, comprising administering a cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need, wherein said tissue is cardiac tissue, preferably the left ventricular wall.

29. A method of enhancing the expression of SDF-1, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need.

30. A method of guiding stem cell chemotaxis to the damaged heart, comprising administering the cross-linked alginate solution as defined in

any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need.

31. A method of inducing neovascularization, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need.

32. A method of inducing therapeutic angiogenesis, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need.

33. A method of preventing conditions resulting from myocardial damage, remodeling and dysfunction, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need, wherein said conditions are selected from the group consisting of left ventricular remodeling, infarct expansion, heart failure, ischemic mitral regurgitation.

34. A method of treating focal or re-entrant arrhythmias, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need

35. A method of improving myocardial contractility, comprising administering the cross-linked alginate solution as defined in any one of claims 8 to 10 and 15, or a composition of any one of claims 17-26, to a subject in need.

36. A method of inducing cardiac cell proliferation, comprising contacting said cells, *in vivo* or *in vitro*, with the cross-linked alginate solution as

defined in any one of claims 8 to 10 and 15, or with a composition of any one of claims 17-26.

37. A kit for repairing damaged tissue, comprising:

(a) a cross-linked polymer solution as defined in any one of claims 1 to 10 and 15, or a composition of any one of claims 17-26;

(b) means for administering the polymer solution into the cardiac site of a patient in need, wherein said means for administering the polymer may be any one of a syringe with a 18-27G needle, any suitable percutaneous cardiac delivery system which includes a cardiac delivery device with a guidewire, including electromechanical mapping or MRI guided catheters, and any percutaneous cardiac device designed to assess the myocardium via the left ventricular cavity, the arterial or venous coronary system;

(c) manual of instructions of how to use said polymer solution.

38. The kit as defined in claim 37, wherein said polymer is an alginate.